Monitoring and Visualisation of Plant Data

Sunny WebBox, Sunny WebBox with *Bluetooth*® and SMA Cluster Controller in Sunny Portal

User Manual

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1 Information on this Document

Validity

This document is valid for plants in the Internet portal Sunny Portal, in which one of the following communication products is installed:

- Sunny WebBox
- Sunny WebBox with *Bluetooth*® Wireless Technology
- SMA Cluster Controller
- Sunny Boy Control / Plus
- Sunny Data Control

Target Group

This document is intended for end users.

Additional Information

Links to additional information can be found at www.SMA-Solar.com:

Document title	Document type
Performance Ratio	Technical information

Symbols

Symbol	Explanation
	Information that is important for a specific topic or goal, but is not safety-relevant
☑	Desired result

Typography

Typography	Usage	Example
"light"	• Display messages on the inverter • Elements on a software interface • Connections	• The value can be read off in the "Energy" field.
bold	• Elements to be selected • Elements to be entered	• Select **Settings**. • Enter **10** in the "minutes" field.
>	• Several elements that are to be selected	• Select **Settings > Date**.
[Button/Key]	• Button or key to be selected or pressed	• Select [Next].

Nomenclature

Full designation	Designation in this document
Small wind turbine system	Plant
PV plant	Plant
SMA Cluster Controller	Cluster Controller
Sunny WebBox with *Bluetooth*® Wireless Technology	Sunny WebBox with *Bluetooth*

Abbreviations

Abbreviation	Designation	Explanation
CSV	Comma-Separated Values	File format
IP	Internet Protocol	
PE	Protective Earth	Protective conductor
SSL	Secure Sockets Layer	Protocol for transmitting coded data via the internet
URL	Uniform Resource Locator	

2 Sunny Portal

2.1 Intended Use

Sunny Portal is an Internet portal for the monitoring of plants as well as the visualization and presentation of plant data.

In order to use Sunny Portal, you need an SMA product that can record your plant data and send it to Sunny Portal (see Section 2.2 "System Requirements" (page 8)). Depending on which SMA product sends the data to Sunny Portal, various functions are available in Sunny Portal.

2.2 System Requirements

☐ A computer with Internet access must be available.

☐ An Internet browser must be installed on the computer.

☐ JavaScript must be activated in the Internet browser.

SMA products required:

In order to use Sunny Portal you will need an SMA product that can record your plant data and send it to Sunny Portal.

The following SMA products are capable of sending data to the Sunny Portal

- Sunny WebBox / Sunny WebBox with *Bluetooth*® Wireless Technology
- SMA Cluster Controller
- Sunny Boy Control / Plus
- Sunny Data Control
- Additional devices (not dealt with in this manual):
  - Sunny Home Manager*
  - Inverters with Webconnect function*
  - Sunny Multigate for plants with module inverters*

* For information on these devices in Sunny Portal, see the user manual of the respective device in Sunny Portal.

Supported Internet browsers:

- Google Chrome as of version 14.0
- Microsoft Internet Explorer as of version 8
- Mozilla Firefox as of version 5
- Opera as of version 11.0
- Safari as of version 5.0

Recommended screen resolution:

- At least 1,024 x 768 pixels

3 Getting Started

3.1 Registering the Plant in Sunny Portal

You can register your plant via the following SMA products in Sunny Portal:

Sunny WebBox / Sunny WebBox with *Bluetooth*® Wireless Technology:

- Register the Sunny WebBox in Sunny Portal as described in the Sunny WebBox / Sunny WebBox with *Bluetooth* manuals.

SMA Cluster Controller:

- Register the Cluster Controller in Sunny Portal according to the instructions in the user manual of the Cluster Controller.

Sunny Boy Control / Plus:

- If your Sunny Boy Control or Sunny Boy Control Plus is equipped with the optional NET Piggy-Back, you can send the plant data to Sunny Portal directly via Ethernet or by means of one of the available modems. Set the type of data transfer to Sunny Portal in the Sunny Boy Control or Sunny Boy Control Plus according to the instructions in the NET Piggy-Back manual.
- If your Sunny Boy Control or Sunny Boy Control Plus is not equipped with the optional NET Piggy-Back, you can register your plant via Sunny Data Control.

Sunny Data Control:

- In Sunny Data Control, configure the Sunny Portal e-mail as described in the Sunny Data Control help. You can obtain the Sunny Data Control software from the download area at www.SMA-Solar.com.

3.2 Logging In and Out of Sunny Portal

Logging into Sunny Portal

Requirement:

☐ You have already registered your plant in Sunny Portal (see Section 3.1 "Registering the Plant in Sunny Portal" (page 9)).

1. Open www.SunnyPortal.com.
2. Activate "SSL" for secure transmission of your login details.
3. In the "E-mail" field, enter the e-mail address you provided when you registered.
4. Enter the password you received by e-mail in the "Password" field.
5. Check the "Remain logged in" box to stay logged in. This way, you will not have to sign in again for your next Sunny Portal session. You will stay logged in, even after closing your browser or switching off your computer. The function will stay activated until you log out of Sunny Portal via the lock symbol in the upper right corner.

Public or Shared Computers

If you are using a public computer or your computer is shared with other persons, please deactivate the function "Remain logged in". Otherwise, other persons could access your data in Sunny Portal.

6. Select [Login].
   ☑ Upon initial login, the "User Information" page opens.
7. Fill in address details.
8. Select [Save].

Delay in visualization

Sometimes it may take up to three hours before the data of your PV plant is displayed in Sunny Portal.

Display depends on the transmitted plant data

Depending on the volume of the plant data transmitted, the display of the available data on the pages may vary.

Logging Out of Sunny Portal

- To end your session in Sunny Portal, select "User Info/Logout > Logout" or log out via the lock symbol in the top right-hand corner.

3.3 Next Steps

- Change your password to ensure that your Sunny Portal account is protected from unauthorised access (see Section 11.6 "Changing your Password" (page 71)).
- Get acquainted with Sunny Portal (see Section 4 "Menu Overview" (page 12)).
- Design your own pages entirely according to your wishes (see Section 6 "Page Design" (page 18)).
- Use the report function of Sunny Portal to receive current updates about your PV plant by e-mail or text message (see Section 7.4 "Report Configuration" (page 46)).
- Enter the properties of your plant (see Section 8 "Plant Properties" (page 49)).
- Give friends access to your Sunny Portal as guests, standard users, installers, or administrators (see Section 11 "User Management" (page 69)).

4 Menu Overview

Menu	Meaning
Plant Selection	This menu will only be shown if more than one plant is assigned to your e-mail address. You can select the desired plant in this menu. The name of the currently selected plant will be used for the main menu item under the "Plant selection" main menu. All other pages always refer to the currently selected plant.
Plant Selection **> Plant List**	The page includes an overview of the plants assigned to your e-mail address. The following data is listed for each plant: • Plant power in kWp • Total yield so far • Total yield for the following periods: – current day – previous day – current month • Specific plant yield (kWh/kWp) for the following periods: – current month – current year When accessing the page, the plant list is always sorted in ascending order according to the specific plant yield. Click on a blue value in the header to sort the plant list in ascending order according to this value, click again to sort the list in descending order.
"Name of your plant"	The menu includes pages with the most important information about your plant: key data, yield, monitoring, and messages. Sunny Portal automatically creates the pages in this menu.
"Name of your plant" **> Plant profile**	This page includes an overview with information for the active plant. Sunny Portal compiles the plant profile from information that you have entered on your Sunny Portal pages. Information that you have not entered (e.g., "Operator") will not be shown in the plant profile. For information in the plant profile (see Table "Information in the Plant Profile" (page 15)).
"Name of your plant" **> Energy and Power**	This page shows the following data of the active plant in 4 diagrams: • Day: power produced over the day • Month: total yield per month in days • Year: total yield per year in months • Total: total yields per year

Menu	Meaning
"Name of your plant" > Grid Management	This page will only be shown if in the plant a device is registered which provides data on grid management (Cluster Controller or Power Reducer Box). In the respective device, the use of Sunny Portal must be activated and the settings for grid management carried out. The page displays the following data: • Diagrams with plant power and the specifications for active power limitation stipulated by the network operator • Table with reports from the plant logbook which are relevant for grid management. Tip: Change to the plant logbook by selecting "System Logbook". • Diagrams with "active power limitation", "cos phi setpoint" and/or "reactive power setpoint" by the network operator. Which diagrams are shown depends on the operating mode of the Cluster Controller/Power Reducer Box. In the case of a Power Reducer Box, the different specifications for individual phases can be represented by separate lines (L1, L2, L3).
"Name of your plant" > Energy Balance	This page is only displayed in plants with a Meter Connection Box. The page displays the following data in a diagram depending on the type of meter connected: • Plant power • Purchased electricity • Self-consumption
"Name of your plant" > Sensors	This page is only shown if a Cluster Controller with connected sensors is registered in the plant. Depending on which sensors are connected, the page will show the following data in diagrams: • Irradiation • Outside temperature and/or module temperature Tip: If you disconnect the sensors from the Cluster Controller, the data collected so far will remain visible.
"Name of your plant" > Performance Ratio	This page is only shown if a Cluster Controller with connected irradiation sensor is registered in the plant. The page shows the following data in diagrams: • Daily performance ratio and irradiation values for the current month • Monthly performance ratio values for the current year
"Name of your plant" > Annual Comparison	The page shows the total yield and the specific yield of the active plant per month in a yearly overview.

Menu	Meaning
"Name of your plant" > Plant Monitoring	On this page, the following functions for monitoring the active plant are available: • Monitoring of communication between Sunny Portal and your plant • Monitoring of the plant by inverter comparison • Monitoring of the grid operator specifications for your plant (only for plants with a Cluster Controller or Power Reducer Box) Plant monitoring, see Section 7.3 "Plant Monitoring" (page 40).
"Name of your plant" > System Logbook	This page shows messages from Sunny Portal and the active plant. These messages will help you to identify plant failures, for example. The figure after the colon shows the number of unread warning, disturbance and error messages.
Presentation	This menu includes standard pages with visualizations of your plant data that are created automatically by Sunny Portal (standard pages, see Section 6.8 "Changing Page Arrangement in the Visualization Menu" (page 37)). All pages that you create yourself are also stored here by Sunny Portal (creating pages, see Section 6.2 "Creating a New Customized Page" (page 20)).
Configuration	This menu includes pages by means of which you can set different configurations for your Sunny Portal, e.g., create own pages, edit plant properties, and create new pages. • Visualization, see Section 6 "Page Design" (page 18) • Plant properties, see Section 8 "Plant Properties" (page 49) • Plant presentation, see Section 9 "Publishing Sunny Portal Pages" (page 57) • Device overview, see Section 10.1 "Calling Up and Filtering the Device Overview" (page 58) • Report configuration, see Section 7.4 "Report Configuration" (page 46) • User management, see Section 11 "User Management" (page 69)
"User Info/Logout"	This menu enables you to call up user information and end your Sunny Portal session. On the "User Information" page, you can also change your password. • User information, see Section 11.4 "Changing User Information" (page 70) • Logout

Information in the Plant Profile

The following table includes the information which may be found in the plant profile and the sources for changing or entering such information.

Information in the Plant Profile	Source
Location	Section 8.1.1 "Changing General Plant Data" (page 49): from details of city and country
Operator	Section 8.2 "Changing Operator Data" (page 52)
Commissioning	Section 8.1.1 "Changing General Plant Data" (page 49)
Plant power	Section 8.1.4 "Setting the Plant Power" (page 50)
Annual production	Section 8.3.3 "Entering the Predicted Annual Yield" (page 54)
CO_2 savings	
Modules	Section 8.1.4 "Setting the Plant Power" (page 50)
Tilt angle	Section 10.2.5 "Setting the Generator Capacity" (page 65), paragraph "Configuring the power of an inverter via multiple strings" (page 65)
Tracking	
Inverter	Sunny Portal receives this information from the devices
Communication	
Description	Section 8.1.5 "Changing the Plant Description" (page 51)
Plant image next to the data	Section 8.1.6 "Changing/Deleting the Plant Image" (page 51)

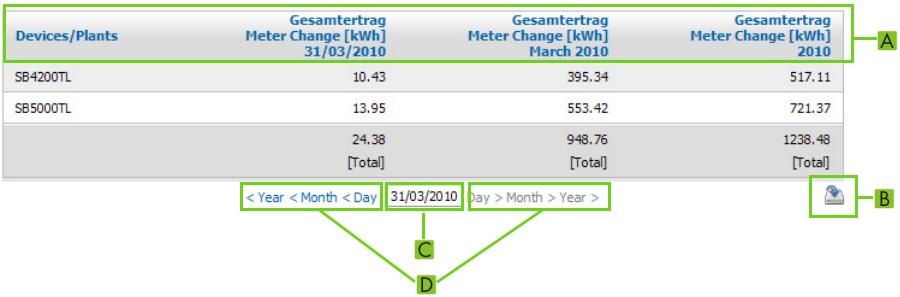
5 Page, Table and Diagram Functions

Page Functions:

At the end of each page with at least two tables or diagrams, you can change the end date for all diagrams and tables on the page. If the period presented in the table or the diagram is one year or one month, the year or month of the entered end date will be adopted.

Table Functions:

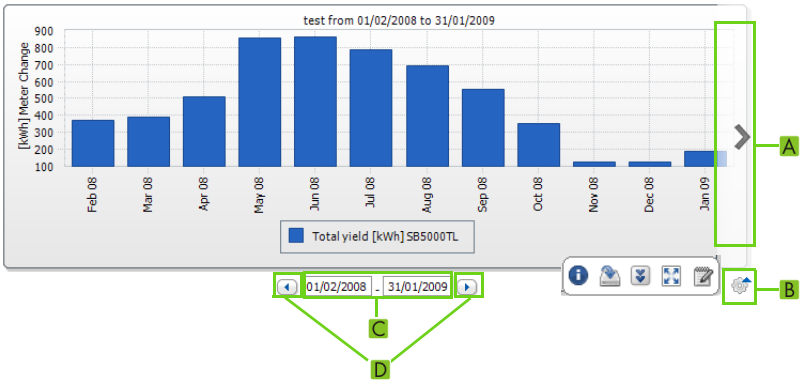
Refer to the following sample table for a description of the functions.



Item	Meaning
A	The table header lets you sort the displayed data in ascending or descending order. Click on a blue value in the header to sort the data in the table in ascending order, click again to sort the data in descending order.
B	Opens a window for saving the data in the configured format
C	Opens calendar In the calendar, you can use the arrows to scroll through the months and select the desired display period.
D	Here, you can scroll to the next or previous display period within the displayed intervals.

Diagram Functions:

Refer to the following sample table for a description of the functions.



Item	Meaning
A	Via the right and left margin of the diagram you can scroll to the next or previous display period, providing that data is available.
B	Opens more buttons for editing the diagram.
C	Opens calendar In the calendar, you can use the arrows to scroll through the months and select the desired display period.
D	Here, you can scroll to the next or previous display period within the displayed intervals.

Buttons for Editing the Diagrams:

Symbol	Meaning
	Opens a sub-menu with the options described below for the diagram.
	Opens a window with a tabular view of diagram values. If the window does not open, refer to Section 12 "Troubleshooting" (page 72).
	Opens a window for saving the data in the configured format
	Shows legend
	Hides legend
	Shows full-screen diagram
	Opens page configuration for editing the diagram.

6 Page Design

6.1 Standard Pages

6.1.1 Overview of Standard Pages

Standard pages are pages with the most important data. They are created automatically by Sunny Portal when your plant data is initially transmitted. The standard pages are saved in the "Visualization" menu. Which standard pages are available for selection depends on the registered device types. Standard pages can be modified (see Section 6.4 "Changing/Deleting Page Contents" (page 35)). They can be recreated if they are erased or modified (see Section 6.1.2 "Creating Standard Pages" (page 19)).

Standard Page	Description
Plant overview	Displayed data of the entire plant: • CO_2 avoided and energy generated on the current day • Meter change of total yield per year in months • Meter change of total yield and mean power values over two days in hours
Power and energy	Displayed data of the entire plant: • Mean power value over one day in hours • Meter change of total yield over seven days in days
Specific plant yield	Displayed data of the entire plant: • Mean values for specific plant yield over one month in days • Mean values for specific plant yield over one year in months
Performance ratio	This will be created and configured automatically in the following cases: • A Sunny SensorBox is added to your Sunny Portal plant. • A communication device (with the exception of Cluster Controller) sends data from an irradiation and temperature sensor to Sunny Portal *. Tip: In the case of plants with Cluster Controller, the page "Performance Ratio" is displayed in the "Name of your plant" menu. Displayed data of the entire plant: • Mean values for performance ratio over one month in days • Mean values for performance ratio over one year in months
Devices **> Overview "Name Of Inverter"**	Displayed data of the inverter: • Meter change of total yield over one year in months • Mean power value over one day in hours

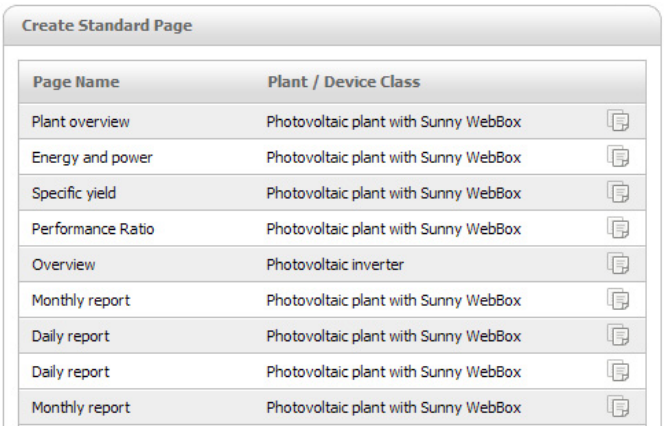
Standard Page	Description
Report **> Daily Plant Report**	Displayed data: • Meter change of total yield for the current day, current month and current year • Meter change of total yield for one day in hours
Report **> Monthly Plant Report**	Displayed data: • Meter change of total yield for current month and current year • Meter change of total yield for one month in days
Sensors **> "Name of the Sensor"**	This will be created and configured automatically in the following cases: • A Sunny SensorBox is added to your Sunny Portal plant. • A communication device (with the exception of Cluster Controller) sends data from an irradiation and temperature sensor to Sunny Portal *. Tip: In the case of plants with Cluster Controller, the page "Sensors" is displayed in the "Name of your plant" menu.

*The sensor will need to be adjusted manually in this case (see Section 8.3.4 "Changing the Performance Ratio" (page 55)).

6.1.2 Creating Standard Pages

Sunny Portal creates the standard pages automatically. Should you have accidentally deleted or changed a standard page, you can create the standard pages as described below:

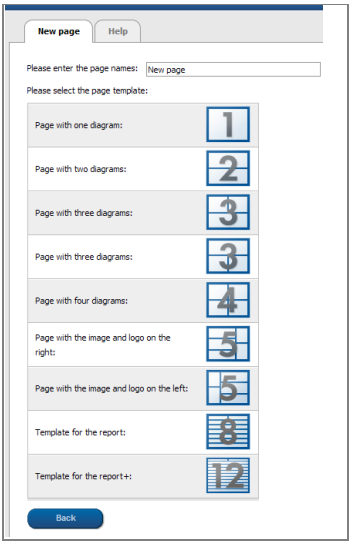
1. Select "Configuration > Visualization".
   ☑ The "Group Configuration" page opens.
2. Select [ ] in the "Create Standard Page" area in the selected page line.



☑ The selected standard page has now been created in the "Visualization" menu.

6.2 Creating a New Customized Page

1. Select "Configuration > Visualization".
   ☑ The "Group Configuration" page opens.
2. Select [New Page].
   ☑ Page templates open.


New page
Help
Please enter the page names:
New page
Please select the page template:
Page with one diagram:
Page with two diagrams:
Page with three diagrams:
Page with three diagrams:
Page with four diagrams:
Page with the image and logo on the right:
Page with the image and logo on the left:
Template for the report:
Template for the report+:
Back

3. Enter page name in "Please enter the page name" field.
4. Select desired page template. Here you can select the page layout. You can place different content in the page sections. TIP: In page templates 8 and 12, the height of the two upper sections is limited. These sections are only suitable for small images such as logos.
   ☑ The "Page Configuration" page opens.
5. In the "Module type" field in one section of the page, select the desired page content.
6. Select [Create] to create desired page content (see Section 6.3 "Generating Page Content" (page 21)).

6.3 Generating Page Content

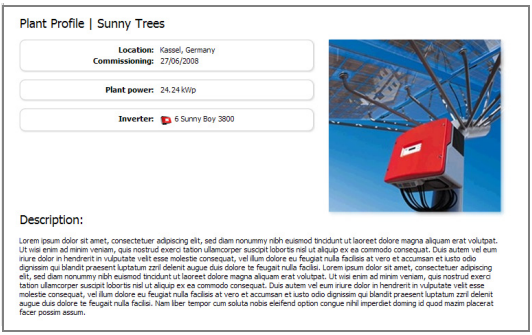
6.3.1 Overview of Page Content

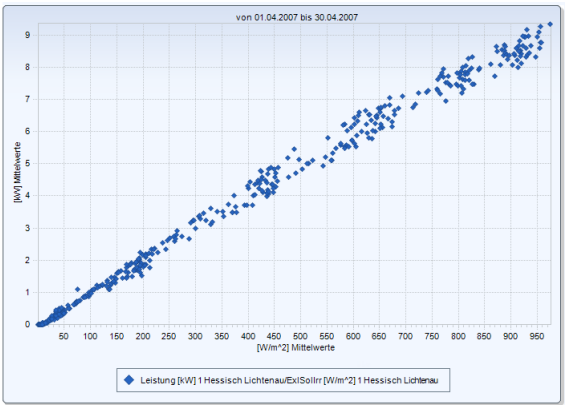
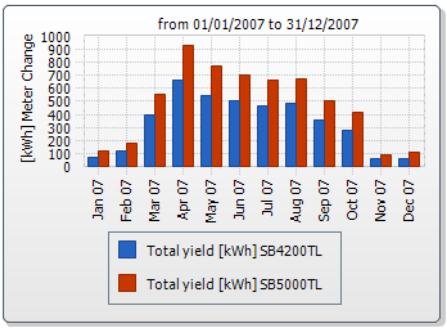
You can choose between the following page contents:

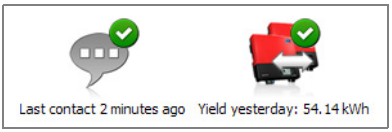
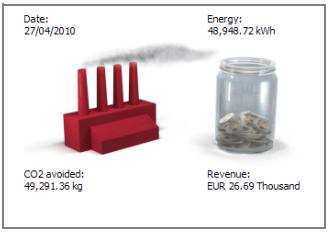
Page content	Content
Table	You can display the following data in tables: • Channel values of the devices Which channel values can be selected depends on the device. • Channel values of the entire plant: – CO_2 savings – Total yield – Performance ratio – Power – Feed-in compensation – Specific plant yield **Example of table:**

Devices/Plants	Gesamtertrag Meter Change [kWh] 31/03/2010	Gesamtertrag Meter Change [kWh] March 2010	Gesamtertrag Meter Change [kWh] 2010
SB4200TL	10.43	395.34	517.11
SB5000TL	13.95	553.42	721.37
	24.38 [Total]	948.76 [Total]	1238.48 [Total]

< Year < Month < Day 31/03/2010 Day > Month > Year >

Page content	Content
Plant profile	You can also use this information on your customised pages. Information in the plant profile: • Plant name • Location • Operator • Date commissioned • Plant power • Annual production • CO_2 savings • PV modules • Azimuth angle • Tilt angle • Tracking • Inverter • Communication • Description **Example of plant profile:** 

Page content	Content
XY diagram	You can display two channel values as coordinates. The x and y axes are each assigned one channel value. The time axis is not shown. Examples of meaningful value pairs are: plant power / irradiation (only for plants with Sunny SensorBox), performance ratio / irradiation. **Example of XY diagram:** 
Chart	You can display a timeline of the channel values for devices or the entire plant as a bar chart or line chart. **Example of chart:** 
Slide show	You can display a slide show created previously on a photo platform.

Page content	Content
Image	You can insert an image of your choice. **Requirements:** • Maximum image size: 500 kB • Possible image formats: JPG, PNG, GIF • Height and width: Sunny Portal adjusts the proportions of the image to match the size of the page layout.
Plant monitoring	You can display the following data: • Communication status between the plant and Sunny Portal • Inverter comparison status **Plant monitoring;** 
Overview	You can display the following data: • Energy of the PV plant • CO_2 saved by the PV plant • Feed-in compensation for the PV plant • Standard image or a random image **Overview with standard image:** 
Text	You can enter and format text in the editor in just the same way as in other text editing programs. If you are familiar with HTML, you can switch to the source code view and enter or edit the HTML code directly. Java Script is not permitted.

6.3.2 Creating Tables

You can select a table from the templates or create your own table. The following table configurations are available:

Table configuration	Meaning
Standard configuration for displaying plant energy	The table includes the total yields of all plants to which you have access. The total yields are displayed for the current day, month and year.
Standard configuration for displaying inverter energy	The table includes the total yields of all inverters in the active plant. The total yields are displayed for the current day, month and year.
Standard configuration for displaying specific inverter yield	The table includes the specific yields and the total yields of all inverters in the active plant. The specific yields are displayed for the current day, month and year. The total yields are displayed for the current day.
User-defined	Create your own table with values and time periods tailored to your needs.

Creating a Table with Standard Configuration

1. Select desired standard configuration.
2. Select [Next].
3. Select [Save].
4. Select [Save].

☑ The table has been created and is now displayed.

Creating a Customized Table

1. Select "User-defined".
2. Select [Next].
3. Select "Add device/plant".
4. In the "Plant/devices" field, select a plant or a device. TIP: In order to narrow your selection, use the "Filter selection" field to choose a device type or "Plants".
5. Select [Accept].
6. In order to add further plants or devices, select "Add device/plant" and repeat previous steps.
7. Select .

   ☑ The "Channel Configuration" page opens.
8. In order to add a heading for this table column or line, enter the heading in the "Name" field.
9. In the "Time unit" field, choose the period for which you wish to have the values displayed.

10. In the "End date of the display" area, activate the desired end date of the display. The following settings are possible:

current	The values generated on the current date (e.g. current day, current month) will always be displayed.
selectable	You can select the date for which the values are to be displayed, e.g. a certain day, a certain month

11. Select the desired channels in the "Channel" area.

Selectable channels

For devices, all channels which are transmitted to Sunny Portal are available. For a plant, the calculated channels are available (CO_2 avoided, energy, power, compensation, performance ratio, specific plant yield).

The unit of the first channel selected determines the additional channels available for selection.

12. If more than one device or plant was added, the desired calculation method can be chosen in the "Result" field. The following settings are possible:

Sum	Total of each channel content within the depicted period
Min	Minimum value of each channel content within the depicted period
Mean values	Mean value of each channel content within the depicted period
Max	Maximum value of each channel content within the depicted period

13. Select [Accept].

☑ The "Page Configuration" page opens.

14. In order to add an additional column or line for further channels, select "Add channel" and repeat previous steps.
15. In the "Orientation" area, activate the desired orientation of the table.
16. In the "Download file type" field, select the format for saving the table data. This will enable you to save the data contained in the page view of the table to your computer via "Download". The following settings are possible:

CSV	File format describing the layout of a text file to be used for the storage or exchange of simply structured data.
ODS	File format for tables with Open Document format enabling the exchange of Office files between various applications and operating systems.
XLSX	File format in the Excel Workbook format supported by Microsoft as of the Excel 2007 version.

17. Select [Save].
18. Select [Save].

☑ The table has been created and is now displayed.

6.3.3 Adding a Plant Profile

1. In order to add a heading, enter the heading in the "Title" field.
2. If there are several plants in the "Plant" field, select the desired plant.
3. Activate the fields for which you wish data to be displayed.
4. Select [Save].
5. Select [Save].

☑ The plant profile has been added and is now displayed.

6.3.4 Creating an XY Diagram

Procedure:

- Configure Y axis, X axis
- Configure time settings
- Make extended configurations

Configuring Y axis, X axis

1. Select a plant or a device in the "Plant/devices" field in the "Y axis", "X axis" area. Only devices of the active plant can be selected. TIP: In order to narrow your selection, use the "Filter selection" field to choose a device type or "Plants".
2. Select a channel in the "Channel" field.

Selectable channels

For devices, all channels which are transmitted to Sunny Portal are available. For a plant, the calculated channels are available (CO_2 avoided, energy, power, compensation, performance ratio, specific plant yield). The unit of the first channel selected determines the additional channels available for selection.

3. Select [+].

   ☑ The table with the selected device or plant is displayed.
4. In order to add further plants or devices, repeat the previous steps.

The selection of further channels is based on the unit of the first channel

If the base unit of the first selected channel is "Watts", the only channels subsequently selectable are those compatible with "Watts". The selection options are automatically restricted by Sunny Portal accordingly.

5. Select the desired unit in the "Unit" field.

6. In the "Value" field, select the channel type for the value. The following channel types are available, depending on the channel:

Analog values	
Mean values	The average value of the channel over the set period.
Maximum values	The highest value of the channel over the set period.
Minimum values	The lowest value of the channel over the set period.

Meter channels	
Meter change	Increase over a period yet to be selected.
Meter reading	Current total meter reading of the value.
Cum. change	Cumulative (= summated) increase over a period yet to be selected.

7. Set automatic scaling or enter own scaling values:
   - Automatic scaling: activate "Automatic scaling min" and "Automatic scaling max**"**.
   - Custom scaling: enter scaling values into "Min" and "Max" fields.

Configuring time settings

1. In the "Depicted time period" field of the "Time settings" area, select the desired display period for the diagram.
2. In the "Count of intervals" field, select how many display intervals are to be shown.
3. In the "Time unit" field, select the time unit by which the intervals should be subdivided.
4. In the "End date of the display" area, activate the desired end date of the display. The following settings are possible:

current	The values generated on the current date (e.g. current day, current month) will always be displayed.
selectable	You can select the date for which the values are to be displayed (e.g. a certain day, a certain month).

Make extended configurations

1. In order to add a heading in the "Extended configuration" area, enter heading in the "Diagram name" field.
2. In the "Download file type" field, select the format for saving the diagram. The following settings are possible:

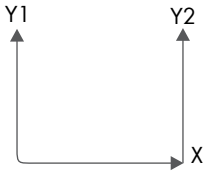
CSV	File format describing the layout of a text file to be used for the storage or exchange of simply structured data.
ODS	File format for tables with Open Document format enabling the exchange of Office files between various applications and operating systems.
XLSX	File format in the Excel Workbook format supported by Microsoft as of the Excel 2007 version.

3. In order to show the legend by default for this diagram, activate "Show legend".
4. In order to see the preview, open the "Preview" area. To reload the diagram after changes, select [Update].
5. Select [Save].
6. Select [Save].

☑ The XY diagram has been created and is now displayed.

6.3.5 Creating a Diagram

A diagram consists of at least one X axis (time settings) and one Y1 axis; the Y2 axis is optional. Several channel values with the same unit can be depicted on each Y axis. Use the Y2 axis if you want to display values having a different unit to that of the Y1 axis.



Procedure:

- Configure the Y1 axis (Y2 axis is optional)
- Configure time settings
- Make extended configurations

Configuring the Y1 axis (Y2 axis is optional)

1. In the "Y1 axis", "Y2 axis" area of the "Plant/Devices" field, select a plant or a device. Only devices of the active plant can be selected. TIP: In order to narrow your selection, use the "Filter selection" field to choose a device type or "Plants".
2. Select desired channel in the "Channel" field.

Selectable channels

For devices, all channels which are transmitted to Sunny Portal are available. For a plant, the calculated channels are available (CO_2 avoided, energy, power, compensation, performance ratio, specific plant yield). The unit of the first channel selected determines the additional channels available for selection.

3. Select [+].

   ☑ The table with the selected device or plant is displayed.
4. In order to add further plants or devices, repeat the previous steps.

Selecting additional channels

The selection of further channels is based on the unit of the first channel. If the base unit of the first selected channel is "Watts", the only channels subsequently selectable are those compatible with "Watts". The selection options are automatically restricted by Sunny Portal accordingly.

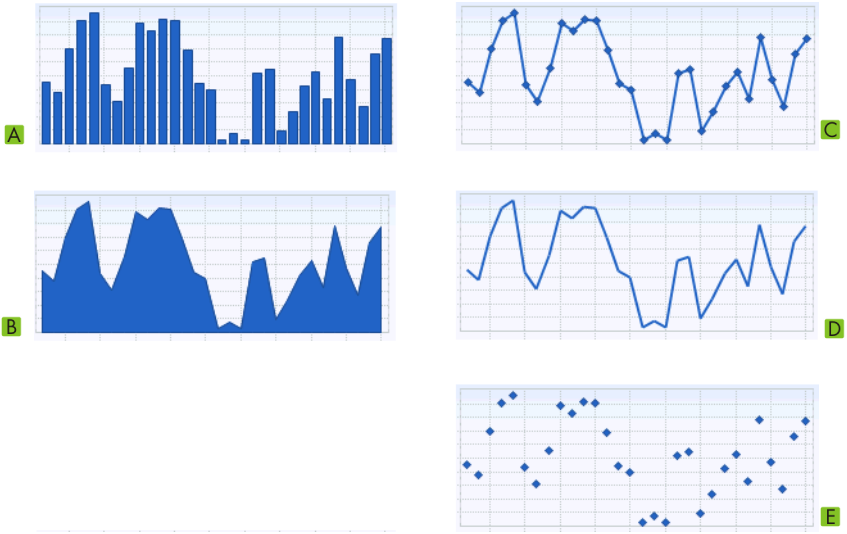
5. Select the desired unit in the "Unit" field.

6. In the "Value" field, select the channel type for the value. The following channel types are available, depending on the channel:

Analog values	
Mean values	The average value of the channel over the set period.
Maximum values	The highest value of the channel over the set period.
Minimum values	The lowest value of the channel over the set period.

Meter channels	
Meter change	Increase over a period yet to be selected.
Meter reading	Current total meter reading of the value.
Cum. change	Cumulative (= summated) increase over a period yet to be selected.

7. Select the type of depiction in the "Chart type" field. The following depiction types are possible:



Item	**Meaning**
A	Bars
B	Shaded area
C	Line with markers
D	Line
E	Markers without line

8. Set automatic scaling or enter own scaling values:
   - Automatic scaling: activate "Automatic scaling min" and "Automatic scaling max".
   - Custom scaling: enter scaling values into "Min" and "Max" fields.

Configuring time settings

1. In the "Depicted time period" field of the "Time settings" area, select the desired display period for the diagram.
2. In the "Count of intervals" field, select how many display intervals are to be shown.
3. In the "Time unit" field, select into which time units the periods should be divided.
4. In the "End date of the display" area, activate the desired end date of the display. The following settings are possible:

current	The values generated on the current date (e.g. current day, current month) will always be displayed.
selectable	You can select the date for which the values are to be displayed (e.g. a certain day, a certain month).

Making extended configurations

1. In order to add a heading in the "Extended configuration" area, enter heading in the "Diagram name" field.
2. In the "Download file type" field, select the download format.
3. In order to show the legend by default for this diagram, activate "Show legend".
4. In order to see the preview, open the "Preview" area. To reload the diagram after changes, select [Update].
5. Select [Save].
6. Select [Save].

☑ The diagram has been created and is now displayed.

6.3.6 Creating a Slide Show

TIP: To ensure high-quality display of the slide show, select a page template with no more than one display module per page.

Procedure:

- Select photo album at Picasa or Flickr
- Integrate slide show into Sunny Portal

Selecting a Picasa photo album

1. Register on picasa.google.com.
2. If you have not yet uploaded any photos to Picasa, create a photo album as described at Picasa.
3. Select photo album.
4. Select [Link to this album].
5. Select [Integrate slideshow].

   ☑ A window opens.

6. "Integrate slideshow" text field.
7. Select the HTML code and copy this to the clipboard.
8. Log out of Picasa and switch to Sunny Portal.

Selecting a Flickr photo album

1. Register on www.flickr.com.
2. If you have not yet uploaded any photos to Flickr, create a photo album as described at Flickr.
3. Select photo album.
4. Select [Slideshow].
   ☑ Slide show begins.
5. Select [Publish].
   ☑ A window opens.
6. Select [Embed HTML].
7. Select [Copy to clipboard].
8. Log out of Flickr and switch to Sunny Portal.

Integrating a slide show into Sunny Portal

1. Call up page configuration of slide show.
2. In order to add a heading, enter the heading in the "Title" field.
3. In the "Data source" field, select the name of the photo platform.
4. Copy HTML code into the "HTML code" field.
5. In order to see the preview, select [Preview].
6. Select [Save].
7. Select [Save].

☑ The slide show has been created and is now displayed.

6.3.7 Creating an Image

Image requirements:

- Maximum image size: 500 kB
- Possible image formats: JPG, PNG, GIF
- Height and width: Sunny Portal adjusts the proportions of the image to match the size of the page layout.

Procedure:

- Upload an image from your own computer to the gallery
- Add an image from the gallery to the page

Uploading an image from your own computer to the gallery

1. Select .
   ☑ A new window opens.
2. Select [Browse].
   ☑ The "Select file" window opens.
3. Open desired image.
   ☑ The path of the image is given in the line.
4. Select [Upload selected file].
5. To upload further images, repeat the procedure.

☑ The image has been uploaded and is now displayed in the gallery.

Adding an image from the gallery to the page

1. In order to add a caption, enter caption in the "Title" field.
2. Select image by a double click.
   ☑ Image is displayed.
3. In order to use a different image, select [Edit] and repeat previous steps.
4. Select [Save].
5. Select [Save].

☑ The image has been inserted on the page and is now displayed.

6.3.8 Creating Plant Monitoring

Requirement:

☐ Plant monitoring is configured (see Section 7.3).

1. In order to add a heading, enter the heading in the "Title" field.
2. Activate "Communication monitoring" and/or "Inverter comparison".
3. Select [Save].
4. Select [Save].

☑ Plant monitoring has been created and is now displayed.

6.3.9 Creating an Overview

Image requirements:

- Maximum image size: 500 kB
- Possible image formats: JPG, PNG, GIF
- Height and width: Sunny Portal adjusts the proportions of the image to match the size of the page layout.

1. Activate field with the desired value.
2. Select unit size.
3. Add an image:
   - In order to use the displayed image, activate "Automatic".
   - In order to use an image of your own, activate "User-defined" and select [Browse].
4. Select [Save].
5. Select [Save].

☑ The overview has been created and is now displayed.

6.3.10 Creating Text

Non-permitted HTML tags:

<SCRIPT> (hence also JavaScript), <META>, <APPLET>, <FORM>, <HTML>, <HEAD>, <FRAME>, <IFRAME>.

1. In order to add a heading, enter the heading in the "Title" field.
2. Enter the desired text in the editor.
3. Select [Save].
4. Select [Save].

☑ The text has been created and is now displayed.

Example: Adding a current webcam image

This example shows how to insert the current image of a webcam using the editor. Each time the page is opened, the current image of the webcam is displayed.

Requirement:

☐ The program of the webcam always saves the current image under the same name.

1. In order to add a heading, enter the heading in the "Title" field.
2. Select .

   ☑ The "Image properties" window opens.
3. Enter the URL of the webcam image in the "Select image" field.
4. Select [OK].

6.4 Changing/Deleting Page Contents

1. Select the name of the page in the "Visualization" menu.
   ☑ The selected page opens.
2. Select the "Page configuration" tab.
3. To change the page content:
   – Select [Edit] in the area of the page content to be changed.
   – Edit page content.
4. In order to delete page content, select [Delete] in the area of the page content to be deleted.

6.5 Changing the Page Name

1. Select the name of the page in the "Visualization" menu.
   ☑ The selected page opens.
2. Select the "Page configuration" tab.
3. Change the page name in the "Name of this page" field.
4. Select [Save].

6.6 Publishing Pages

You can publish the following pages:

- All pages in the "Visualization" menu
- The following pages of the "Name of your plant" menu:
  – Plant profile
  – Power and energy
  – Annual comparison

Options for publishing:

- Present pages at www.SunnyPortal.com in the "Publicly Available Plants" area
- Present pages on the Internet

Presenting Pages on Sunny Portal in the "Publicly Available Plants" Area

1. Select the name of the desired page.
   ☑ The selected page opens.
2. If you have chosen a page in the "Visualization" menu, select the "Page configuration" tab.
3. If you have chosen a page in the "Name of your plant" menu, select "Configuration > Name of page".
4. Activate the field "Also release page on www.sunnyportal.com".
   ☑ The link "Send page by e-mail" is displayed alongside.

5. In order to send the page by e-mail, select "Send page by e-mail". A window for sending the e-mail opens. Make the following settings:
   - Enter the recipient's e-mail address in the "E-mail address of the recipient" field.
   - In order to change the name of the sender, change entry in the "Name of the sender" field.
   - In order to add a message to the recipient, enter desired text in the "Your message to the recipient (optional)" field.
   - Select [Send e-mail].
6. Select [Save].
7. In order to see a preview, select "Open page in a new window".

☑ The page is now published.

Presenting pages on the Internet

Each of your Sunny Portal pages has its own URL. You can use this URL to configure a link from another website to your page. You can call up the URL of the page as follows:

1. Select the name of the desired page.

   ☑ The selected page opens.
2. Call up configuration:
   - If you have chosen a page in the "Visualization" menu, select the "Page configuration" tab.
   - If you have chosen a page in the "Name of your plant" menu, select "Configuration > Name of page".
3. In order to see a preview, select "Open page in new window".
4. Copy URL from "URL of the Page" field and copy it as a link into a program for creating web pages (e.g., Microsoft Office Frontpage) or integrate it into your own web page through a so-called iFrame.

6.7 Deleting Pages

You can delete all pages of the "Visualization" menu.

1. Select the name of the page in the "Visualization" menu.

   ☑ The selected page opens.
2. Select the "Page configuration" tab.
3. In order to delete the page, select [Delete page].
4. Click [Yes] to confirm.

6.8 Changing Page Arrangement in the Visualization Menu

6.8.1 Creating a New Group

Once you have created a new group, you can assign pages to the group by changing the page positions.

1. Select "Configuration > Visualization".
   ☑ The "Group Configuration" page opens.
2. Select [New group].
   ☑ The "Configure group" page opens.
3. Enter a name for the group in the "Group title" field.
4. Select [Save].

☑ The new group is now visible in the directory tree and in the "Visualization" menu.

6.8.2 Changing the Positions of Pages and Groups

Groups are moved as groups, together with the pages assigned to them. The position of the "(without group)" group cannot be changed; it always remains at the top of the list.

1. Select "Configuration > Visualization".
   ☑ The "Group Configuration" page opens.
2. Select "Modify position".
3. Select the name of the group or page.
   ☑ Arrow keys are now active. The name of the page or group is highlighted grey.
4. Use the up or down arrow to move the page or group.
   ☑ The page or group moves one step at a time.
5. Keep pressing the corresponding arrow until the desired position is reached.
6. Select [Save].

6.8.3 Deleting a Group

Group and all sub-pages will be deleted permanently.

If you delete a group, all the sub-pages assigned to the group will also be permanently erased.

1. Select "Configuration > Visualization".
   ☑ The "Group Configuration" page opens.
2. Select the name of the group.
3. Select [New group].
   ☑ The "Configure group" page opens.
4. Select [Delete] to delete the group permanently.

7 System Monitoring

7.1 Overview of Monitoring Functions

Sunny Portal includes the following monitoring functions for your plant:

Monitoring	Sunny Portal Function	Section
Plant events	**System Logbook** The system logbook allows you to view messages pertaining to events which have occurred in your plant.	7.2 "System Logbook" (page 39)
	Report Configuration If you are using report configuration, you will receive an e-mail with the events which have occurred in your plant.	7.4 "Report Configuration" (page 46)
Yield, feed-in compensation, power, CO_2 avoided	**Report Configuration** Here, you can configure the function enabling you to receive an e-mail with your plant data.	
Inverter yields outside of the tolerance	**Plant Monitoring – Inverter Comparison** If you set the inverter comparison option, you will receive an e-mail as soon as the specific yield of an inverter exceeds the tolerance.	7.3.3 "Setting Inverter Comparison" (page 45)
Communication between the Sunny Portal and SMA communication products*	**Plant Monitoring - Communication Monitoring** If you set the communication monitoring option, you will receive an e-mail whenever the connection between Sunny Portal and SMA communication products* is interrupted.	7.3.2 "Setting Communication Monitoring" (page 44)
Incoming setpoints for your plant from the network operator	**Setpoint Monitoring** If you activate the setpoint monitoring, you will receive an e-mail as soon as the network operator transmits setpoints to your Cluster Controller/Power Reducer Box (e.g. to limit the active power).	7.3.4 "Setpoint Monitoring: Setting the E-Mail Alert" (page 45)

*Sunny WebBox with *Bluetooth*, Sunny WebBox, Cluster Controller, Power Reducer Box

7.2 System Logbook

On the page "Name of your plant > System logbook" you will receive messages from Sunny Portal and your plant. These messages will help you to identify plant failures, for example. The figure after the colon in the menu name shows the number of unread warning, disturbance and error messages (system logbook: x, x = number of messages).

7.2.1 Calling up and Filtering Messages

You can filter messages in the system logbook in order to narrow down the list of messages.

1. Select "Name of your plant".
2. Select "System logbook".
3. Set the desired filters. The following settings are possible:

Go to	Here you can select the date of the messages to be displayed.
Status	• Non-acknowledged: non-acknowledged messages are displayed (default setting). • Acknowledged: acknowledged messages are displayed. • All: both acknowledged and non-acknowledged messages are displayed.
Plant/Devices	• All: messages from Sunny Portal, the plant, Service, and the devices are displayed. • Portal: messages from Sunny Portal and the communication devices are displayed. • Plant: messages from all inverters in the active plant are displayed. • Devices (e.g. SB 4200TL): messages for the selected device are displayed.
Number per page	This allows you to select how many messages are to be displayed per page.
Type	This allows you to select which messages are to be displayed: info, warning, disturbance, error.

7.2.2 Acknowledging Messages

You can acknowledge messages in order to mark them as read. This allows you to differentiate between read and new messages.

1. Activate the fields in front of messages to be acknowledged.
2. In order to select all messages, activate "Select all".
3. To acknowledge a message immediately, select the red tick.
4. Select [Submit].

7.3 Plant Monitoring

7.3.1 Overview of Plant Monitoring

The page "Name of your plant > Plant monitoring" provides information on the monitoring status of your plant. You can set and activate various monitoring options. If desired, the plant monitoring can send you an alert via e-mail. The "Plant Monitoring" page is subdivided into a maximum of 4 areas:

Area	Meaning
Plant configuration	Is only displayed if Sunny Portal has detected a new device in your plant (see Section 10.2.7 "Adding/ Replacing Devices (Configuration Wizard)" (page 67)).
Communication monitoring	Indicates whether there is connectivity between Sunny Portal and SMA communication products* . E-mail alerts possible.
Inverter comparison	Displays whether the inverter yields of the selected inverters are within the configured range. E-mail alerts possible.
Setpoint monitoring	This function is only available if a device is registered in the plant which provides grid management data (Cluster Controller or Power Reducer Box). In the respective device, the use of Sunny Portal must be activated and the settings for grid management carried out. Shows whether the plant is feeding into the electricity grid without restrictions by the grid operator. This area only indicates setpoints for active power limitation. E-mail alerts possible upon reception of the following setpoints: • Active power limitation • Reactive power setpoint (fixed reactive power or phase shift factor cos-phi)

*Sunny WebBox with *Bluetooth*, Sunny WebBox, Cluster Controller, Power Reducer Box

Communication monitoring:

Communication monitoring monitors the connection between Sunny Portal and the following devices:

- Sunny WebBox / Sunny WebBox with *Bluetooth*:

  At certain time intervals, Sunny Portal checks whether Sunny WebBox has sent the data to Sunny Portal with the specified frequency. You can set the frequency with which Sunny WebBox should send data to Sunny Portal in the user interface of Sunny WebBox.

- Cluster Controller:

  Sunny Portal checks whether the Cluster Controller reports to the Sunny Portal with the specified frequency. You can set the frequency with which the Cluster Controller should report to Sunny Portal in the user interface of the Cluster Controller.

- Power Reducer Box:

  Sunny Portal checks whether the Power Reducer Box reports regularly in Sunny Portal. You can set the frequency with which the Power Reducer Box should report in Sunny Portal in the user interface of the Power Reducer Box.

If one of these devices does not report in Sunny Portal over a prolonged period of time, an alert mail will be sent to the given e-mail address. After the alert mail, a reminder e-mail that the error is still active will be sent on up to three subsequent days. The error will continue to be displayed in Sunny Portal until the device reports to Sunny Portal again. A description of how to configure communication monitoring is given in Section 7.3.2 "Setting Communication Monitoring" (page 44). The following table explains the meaning of the communication monitoring symbols:

Communication monitoring		
Symbol	**Status**	**Meaning**
	Deactivated	Communication monitoring is not configured.
	OK	Communication with Sunny Portal is OK. The time of last contact is displayed.
	Error	Communication with Sunny Portal is interrupted. Use the "Details" link to view detailed information on the time of last contact. The following navigation options are available: • Link to the device properties • Link to the parameters • Link to device messages in the system logbook
		By clicking on this bell icon, you can halt the sending of reminder e-mails for the current error. For new errors, the sending of a reminder e-mail will start again.

Status of the Device*		
Symbol	**Status**	**Meaning**
	Error	Communication with Sunny Portal is interrupted.

*Sunny WebBox with *Bluetooth*, Sunny WebBox, Cluster Controller, Power Reducer Box

Inverter Comparison:

Sunny Portal gives you the option of inverter comparison for plants with at least 2 PV inverters. Sunny Central inverters are not supported.

Based on daily yield, Sunny Portal calculates the specific yield for each active inverter and compares this once a day with the mean value of the specific yields of all inverters. Should the specific yield of an inverter by comparison with the average specific yield be below a configurable tolerance, Sunny Portal will inform you by e-mail. How to configure the inverter comparison option is described in Section 7.3.3 "Setting Inverter Comparison" (page 45). The following table explains the meaning of the inverter comparison symbols:

Inverter comparison		
Symbol	**Status**	**Meaning**
	Deactivated	Inverter comparison is not activated.
	OK	The yields of the monitored inverters are within the configured range. The yield of the last day is displayed.
	Error	Specific inverter yield is outside of tolerance for at least one monitored inverter. Use the additional "Details" link to view information on the actual specific yield of the respective inverter or inverters and the comparison value calculated from the mean values of all monitored inverters. The following navigation options are available: • Link to the device properties • Link to messages in the system logbook

Setpoint monitoring:

Sunny Portal provides a setpoint monitoring option for all plants with Cluster Controller or Power Reducer Box. In the "Setpoint monitoring" area, you can see whether the grid operator has specified any setpoints for the active power limitation of your plant. If you wish, Sunny Portal can inform you by e-mail about incoming setpoints for active power limitation and reactive power setpoint (fixed reactive power or phase shift factor cos-phi). How to configure the e-mail notification for setpoint monitoring is described in Section 7.3.4 "Setpoint Monitoring: Setting the E-Mail Alert" (page 45).

In addition to setpoint monitoring, you should use the communication monitoring for the Cluster Controller/Power Reducer Box (see Section 7.3.2). This monitoring option enables Sunny Portal to identify whether or not the setpoint monitoring information may be outdated.

The following table explains the meaning of the setpoint monitoring symbols:

Status of setpoint monitoring for active power limitation		
Symbol	**Status**	**Meaning**
	No setpoint	There is no setpoint for active power limitation.
	Setpoint	There is a setpoint for active power limitation.
	Problem with a Cluster Controller/ Power Reducer Box	There is a problem with a Cluster Controller/Power Reducer Box.

Status of the Power Reducer Box		
Symbol	**Status**	**Meaning**
	Ok	The Power Reducer Box is working properly.
	Disturbance	The Power Reducer Box has received a signal from the radio ripple control receiver that is not configured in the Power Reducer Box.
	Error	There is no connection between the Power Reducer Box and at least one Sunny WebBox. or There is no Sunny WebBox registered in the Power Reducer Box.

Status of the Cluster Controller		
Symbol	**Status**	**Meaning**
	Ok	The Cluster Controller is working properly.
	Warning	The Cluster Controller hat received a signal from the signal source that is not configured in the Cluster Controller.
	Error	There is an error in the Cluster Controller.

7.3.2 Setting Communication Monitoring

Requirements:

- If you wish to monitor the communication between Sunny WebBox and Sunny Portal:
  - The Sunny WebBox is registered in Sunny Portal (see Sunny WebBox manual).
  - Use of Sunny Portal is activated on the user interface of the Sunny WebBox (see Sunny WebBox manual).
- If you wish to monitor the communication between Cluster Controller and Sunny Portal:
  - The Cluster Controller is registered in Sunny Portal (see user manual of the Cluster Controller).
  - The use of Sunny Portal is activated on the Cluster Controller user interface and communication monitoring is switched on (see Cluster Controller user manual).
- If you wish to monitor the communication between the Power Reducer Box and Sunny Portal:
  - The Power Reducer Box is registered in Sunny Portal (see Power Reducer Box manual). To this end, all Sunny WebBox devices must be registered in the Power Reducer Box and at least one of these Sunny WebBox devices must be registered in Sunny Portal.
  - The use of Sunny portal is activated in the Power Reducer Box and communication monitoring is switched on (see Power Reducer Box manual).

1. Select "Name of plant > Plant monitoring".
2. In the "Communication Monitoring" area select [Settings].
3. Set alert. The following settings are possible:

off	Communication monitoring is deactivated in Sunny Portal.
liberal, tolerant, acute	Here, you can select how fast you wish to be notified about the interrupted communication. The time span indicates how long Sunny Portal should wait before sending an e-mail after the expected contact has failed. – "acute": alert 15 minutes after contact overdue – "tolerant": alert 1 hour after contact overdue – "liberal": alert 3 hours after contact overdue

4. Enter the recipient's e-mail address for notifications in the "Recipient" field. If you enter several e-mail addresses, please separate these by commas.
5. For the required devices activate the "Monitoring" field.
6. Select [Save].

7.3.3 Setting Inverter Comparison

Depiction of the inverters in groups or individually:

The inverters are depicted as a group if they are of the same type, have the same set tolerance and have been selected for inverter comparison. If at least one feature is different, the inverters will be listed individually.

1. Select "Plant name > Plant monitoring".
2. In the "Inverter Comparison" area, select [Settings].
3. Enter the recipient's e-mail address for notifications in the "Recipient" field. If you enter several e-mail addresses, please separate these by commas.
4. If necessary, change the preset generator power in the "Generator power [kWp]" field. Sunny Portal calculates the generator power based on the nominal power of the inverter. You can configure the generator power for each inverter (see Section 10.2.5 "Setting the Generator Capacity" (page 65)).
5. In the "Tolerance [%]" field, change the permitted preset tolerance for inverter specific yield, if necessary. If the specific yield is outside the tolerance range, Sunny Portal will inform you by e-mail.
6. Activate the "Monitoring" field for the desired inverters. By doing this, the inverters will be selected for the inverter comparison.
7. Select [Save].

7.3.4 Setpoint Monitoring: Setting the E-Mail Alert

Requirements:

☐ The Cluster Controller/Power Reducer Box is registered in Sunny Portal (see user manual of the Cluster Controller/Power Reducer Box).

☐ The use of Sunny Portal is activated in the Cluster Controller/Power Reducer Box (see user manual of the Cluster Controller/Power Reducer Box).

1. Select "Plant name > Plant monitoring".
2. In the "Setpoint monitoring" area, select [Settings].
3. To receive an alert by e-mail:
   - Activate field "Send alert whenever control commands are received from grid operator".
   - Enter the recipient's e-mail address for notifications in the "Recipient" field. If you enter several e-mail addresses, please separate these by commas.
4. If you do not wish to receive an alert, deactivate the field "Send alert whenever control commands are received from grid operator".
5. Select [Save].

7.4 Report Configuration

Reports contain plant data or events for your plant. Sunny Portal sends reports by e-mail.

Receiving e-mails as text messages on your cell phone

You can also receive the report e-mails as a text message through your mobile network provider or have them forwarded as a text message from your mailbox.

Direct text messages from the Sunny WebBox with optional GSM modem

If you have an installed GSM modem, the Sunny WebBox can notify you directly of error events by e-mail and text message.

Sunny Portal takes late data into account in the following reports

If relevant data is received after the report has been sent, Sunny Portal will incorporate the data into the subsequent report.

The following three types of report are available, and you can configure three in each case:

Report	Selectable channels
Daily info report 1 to 3	• Daily yield (kWh) • Feed-in compensation today • Max. power today (kW) • CO_2 avoided today (kg)
Monthly info report 1 to 3	• Monthly yield (kWh) • Monthly feed-in compensation • Max. power for the month (kW) • CO_2 saved (kg) this month
Event report 1 to 3	For each of the three event reports you can choose four message types from Sunny Portal, from the plant, and from Service: • Information • Warnings • Disturbances • Errors

7.4.1 Configuring the Daily Info Report/Monthly Info Report

For the daily info report, the daily data for each channel, and for the monthly info report, the monthly data for each channel is transmitted. You can configure three monthly info reports and three daily info reports each containing different data. Each daily info report can be sent at a set time; the monthly info reports are sent at the end of the month.

1. Select "Configuration / Report Configuration".
2. In the "Report configuration" field, select a daily info report or a monthly info report.
3. Select [Edit].
4. Configure report. The following settings are possible:

Activate report	If the report is activated, it will be sent to the configured e-mail address at the set interval. You can also save report settings and activate the report later.
Recipient	In the "E-mail address(es):" field, enter the recipient's e-mail address. If you enter several e-mail addresses, please separate these by commas.
Interval	In the "Send report at:" field, select the time at which you would like to receive the e-mail.
Content	
Channel selection	Activate the channel fields to be displayed in the report.
Send report as:	Text: You receive the e-mail with the data in text format. In the "Send data in:" area, activate the fields in which the data should be displayed in the e-mail. • Subject of the mail: The data is displayed in the subject line of the e-mail. • Contents of the mail: The data is displayed in the body of the e-mail.
	HTML: You receive the e-mail with the data in HTML-Format. PDF: You receive the e-mail in text format, with the data as a PDF attachment. In the "Portal page to be sent:" field, select which Sunny Portal page you wish to be sent with the e-mail. If you want to generate a standard report page, save your report settings and create the report manually afterwards.

5. In order to send a test report to a set e-mail address, select [Send test report].
6. Select [Save].

7.4.2 Configuring an Event Report

You can set up three event reports each containing different events and to be sent at different times. You can select four events from Sunny Portal and the plant: information, warnings, disturbances, errors.

1. Select "Configuration / Report Configuration".
2. Select an event report in the "Report Configuration" field.
3. Select [Edit].
4. Configure report. The following settings are possible:

Activate report	If the report is activated, it will be sent to the set recipients at the set interval. You can also save report settings and activate the report later.
Recipient	In the "E-mail address(es):" field, enter the recipient's e-mail address. If you enter several e-mail addresses, please separate these by commas.
Interval	In order to receive the report hourly, activate the "Hourly" field. In order to receive the report daily, activate the "Daily" field and select the time.
Content	
	In the "Portal" and "Plant" lines, activate the respective fields of the events to be included in the report.
Send report as:	Text: You receive the e-mail with the data in text format.
	HTML: You receive the e-mail with the data in HTML format.
	PDF: You receive the e-mail in text format, with the data as a PDF attachment.
Maximum number of messages in one report	Select the maximum number of messages permitted in one report.
	If you require empty reports to be sent as well, activate "Send empty reports if no new events are available".

5. In order to send a test report to set e-mail addresses, select [Send test report].
6. Select [Save].

7.4.3 Manually Regenerating Reports

You can regenerate the report of a certain date at a later time. Thereafter, you can send the report to the e-mail addresses configured in the report.

1. Select "Configuration / Report Configuration".
2. Select the desired report in the "Report Configuration" field.
3. In the "Report date" field in the "Regenerate report manually" area, select the date of the report to be regenerated.
4. Select [Generate].

☑ Next to the button a message is displayed that the report has been sent.

8 Plant Properties

8.1 Plant Data

On the "Configuration > Plant Properties" page, you can view or edit general information on your PV plant. Some of the information is displayed on the "Plant profile" page.

You can perform the following settings, as explained in the sections below:

- Change general plant data
- Change the plant name
- Delete the Plant
- Set the plant power
- Change the plant description
- Create a plant image

8.1.1 Changing General Plant Data

1. Select "Configuration > Plant Properties".
2. Select the "Plant data" tab.
3. Select [Edit].
4. Change the plant data. The following settings are possible:

Name	Name of the active plant. The plant identifier is used as the default plant name. (Changing plant name, see Section 8.1.2 "Changing the Plant Name" (page 50)).
Plant identifier	Plant identifier for the plant currently selected. The plant identifier is defined when you register the plant.
Commissioning	Date on which the plant was created in Sunny Portal.
Street/no.	Street address to which the plant is assigned.
Postal code/city	Postal code and city to which the plant is assigned.
Country	Country in which the plant is located.
Federal state	Federal state in which the plant is located.
Time zone	Here, you can select the time zone.
Longitude	Longitude and latitude of the plant location. In order to have the geodata for the location automatically entered from the database, select "Find geodata".
Latitude	
Height	Altitude of plant location

5. Select [Save].

8.1.2 Changing the Plant Name

The plant identifier is used as the default plant name. You can change the plant name and assign your plant a name. If you have several plants registered at Sunny Portal, you will be able to distinguish better between plants by assigning them meaningful names.

1. Select "Configuration > Plant Properties".
2. Select the "Plant data" tab.
3. Select [Edit].
4. In the "Name" field, enter the desired name for the plant (e.g., "Smith House" or "WebBox Plant South").
5. Select [Save].

8.1.3 Deleting the Plant

You cannot undo the delete process.

If you delete a plant, all devices and data related to this plant are permanently deleted.

1. Select "Configuration > Plant Properties".
1. Select the "Plant data" tab.
2. Select [Edit].
3. Select [Irretrievably delete plant].
4. To delete plant permanently, Select [Yes].

8.1.4 Setting the Plant Power

The plant power is the sum of the power of all PV modules.

Options for Configuring Plant Power:

- Enter the plant power manually
- Calculate plant power from the total power of all the inverters

Entering the Plant Power Manually

1. Select "Configuration > Plant Properties".
2. Select the "Plant data" tab.
3. Select [Edit].
4. In the "Power" area, "Plant power" field, enter the plant power.
5. In order to configure the PV module manufacturer, make a selection in the "Manufacturer" field.
6. In order to configure the module type, make a selection in the "Module type" field. The possible settings depend on the selected manufacturer.
7. Select [Save].

Calculating the plant power from total power of all inverters

1. Set the power of the individual inverters, see Section 10.2.5 "Setting the Generator Capacity" (page 65).
2. Select "Configuration > Plant Properties".
3. Select the "Plant data" tab.
4. Select [Edit].
5. In the "Power" area, activate "Calculate plant power from device properties" field.
   ☑ Plant power is calculated and displayed.
6. Select [Save].

8.1.5 Changing the Plant Description

You can enter important features of the plant in the description. The editor can format text but does not support HTML. The text is also displayed on the "Plant profile" page.

1. Select "Configuration > Plant Properties".
2. Select the "Plant data" tab.
3. Select [Edit].
4. Enter your description in the "Description" area.
5. Select [Save].

8.1.6 Changing/Deleting the Plant Image

The plant image is the image (A) in the menu "Name of your plant". You can change this image. You can upload an image from your computer or select an image from your own Sunny Portal image gallery. You can store own images in the gallery for later use on your pages.

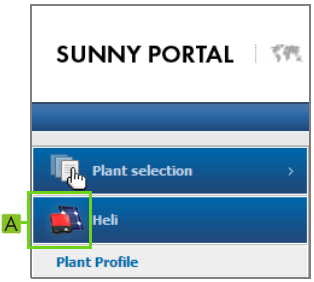


Image requirements:

- Maximum image size: 500 kB
- Possible image formats: JPG, PNG, GIF
- Height and width: Sunny Portal adjusts the proportions of the image to match the size of the page layout.

Changing the plant image

1. Select "Configuration > Plant Properties".
2. Select the "Plant data" tab.
3. Select [Edit].
4. To upload an image from your computer:
   - Select [Load Image] in the "Plant Image" area.
   - ☑ The "Select file" window opens.
   - Select desired image.
   - Select [Open].
   - To change the image section, use the mouse to adjust the edges of the grey squares.
5. To select an image from the gallery:
   - Select [Select from the gallery] in the "Plant image" area.
   - ☑ The image gallery opens.
   - Select the desired image by double clicking it.
   - To change the image section, use the mouse to adjust the the grey squares.
6. Select [Save].

Deleting the plant image

You can delete your own plant images. If you have deleted your plant image, Sunny Portal will revert to the default plant image.

1. Select "Configuration > Plant Properties".
2. Select the "Plant data" tab.
3. Select [Edit].
4. Select [No plant image] in the "Plant image" area.
5. Select [Save].

8.2 Changing Operator Data

You can enter the data of the plant operator in the plant properties in Sunny Portal, as described in this section. The name of the operator is displayed on the "Plant profile" page. The operator is a private or legal person who, for example, owns large-scale PV plants for business purposes and makes them available for use, without necessarily being the user himself.

1. Select "Configuration > Plant Properties".
2. Select "Operator" tab.
3. Select [Edit].
4. Change operator data.
5. Select [Save].

8.3 Parameters

This section describes how you can change the display parameters for your plant in Sunny Portal. These settings are only relevant for the display of your plant in Sunny Portal and have no effects on the devices. The following sections contain a description of the parameters and information on the calculations for which Sunny Portal needs these parameters.

8.3.1 Changing the Feed-in Tariff

You can either sell the electricity generated by the plant or use it for your own consumption. The amount of the compensation or the saving, as the case may be, should be entered here. Sunny Portal then calculates the amount of money you are earning or saving. The feed-in tariff in Germany is regulated by the Renewable Energy Sources Act (EEG).

1. Select "Configuration > Plant Properties".
2. Select the "Parameters" tab.
3. Select [Edit].
4. Enter amount of compensation.
5. Select currency.
6. Select [Save].

Automatic calculation of feed-in tariff - applies only to Germany

1. Select [Calculate the feed-in tariff according to the Renewable Energy Sources Act (EEG)].
   ☑ The "Calculate compensation" window opens.
2. Select plant type.
3. Select year of plant commissioning.
4. Select [Accept].
   ☑ The window closes. The amount of compensation is displayed.
5. Select [Save].

8.3.2 Changing the CO_2 Avoided Factor

The CO_2 factor indicates how much CO_2 is produced for every single kilowatt hour of electricity generated in the country. Depending on the technology used and the efficiency of the facility, the CO_2 factor can vary between the electric utility companies in a region. You can find out the CO_2 factor of the electricity supplied in your region from your electric utility company. The CO_2 factor is used by Sunny Portal to calculate how much CO_2 has been saved by eco-friendly power generation in your plant.

1. Select "Configuration > Plant Properties".
2. Select the "Parameters" tab.
3. Select [Edit].
4. Enter CO_2 factor in the "Factor" field or adjust with the slider.
5. Select [Save].

8.3.3 Entering the Predicted Annual Yield

The predicted annual yield is the yield to be expected from a PV plant within one year. Sunny Portal uses a table to show how the predicted annual yield of your PV plant is distributed throughout the months of the year.

The predicted annual yield of the PV plant is calculated from the specific annual yield (kWh/kWp) at the location of the PV plant multiplied by the plant power in kWp. The plant power is also called nominal power.

You can obtain the specific annual yield for your PV plant location from irradiation maps. Local conditions such as degrees of shading or the orientation of the plant are not taken into account. You can find out the plant power in kWp from your installer.

1. Select "Configuration > Plant Properties".
2. Select the "Parameters" tab.
3. Select [Edit].
4. Enter specific annual yield in kWh/kWp in the "Specific Annual Yield" field.
5. If the "Plant Power (Nominal Power)" field is empty, set the plant power (see Section 8.1.4 ”Setting the Plant Power” (page 50)).
6. Select [Save].

Changing the monthly distribution of the predicted annual yield

The monthly distribution shows how the predicted annual yield is distributed throughout the months of the year. Given full details of the plant location, Sunny Portal can suggest a distribution. You can also enter the distribution manually.

1. Select "Configuration > Plant Properties".
2. Select the "Parameters" tab.
3. Select [Edit].
4. If the "Plant Location" field is empty, enter details of the plant location under the "Plant Data" tab (see Section 8.1.1 ”Changing General Plant Data” (page 49)).
5. Select [Suggest a Monthly Distribution].
6. In order to enter the monthly distribution manually, enter values in the "in %" fields.
7. Select [Save].

8.3.4 Changing the Performance Ratio

The performance ratio is a location-independent measure of the quality of a PV plant, and is therefore often called the quality factor. The performance ratio (PR) is given in percent and describes the relationship between the actual and target yields of the plant. It thus shows the proportion of the energy that is actually available for feed-in to the grid after deduction of energy loss (e.g. due to thermal losses and conduction losses) and of the requisite operating current.

The closer the PR value determined for a plant is to 100%, the more efficiently the respective plant is operating. In reality, a value of 100% cannot be achieved, as unavoidable losses always arise during operation of the plant (e.g. thermal losses due to the warming of the PV modules). However, high-performance plants can reach a performance ratio of up to 80%.

The parameters for the performance ratio are configured automatically when one of the following devices is added to your Sunny Portal plant.

- Sunny SensorBox
- Cluster Controller with connected irradiation sensor

Cluster Controller temperature sensors

If a module temperature sensor is connected to the Cluster Controller, the module temperature sensor readings are taken into account in the calculation of the performance ratio. This renders the value of the performance ratio more exact. However, a satisfactory PR calculation is also possible without a temperature sensor.

Manual adjustment of the irradiation and temperature sensor

In the following cases, you will need to adjust the parameters of the irradiation and/or temperature sensor manually.

- If there are several Sunny SensorBox devices in the plant
- If there is a Sunny SensorBox and a Cluster Controller with connected irradiation sensor in the plant
- If the list of parameters has been changed
- If you have replaced a Sunny SensorBox or a Cluster Controller

The reason for this is that the standard page "Performance ratio" in the "Visualization" menu is not updated automatically.

1. Select "Configuration > Plant Properties".
2. Select the "Parameters" tab.
3. Select [Edit].
4. In the "Irradiation sensor" field, select the sensor based on the serial number of the Cluster Controller / Sunny SensorBox.

5. Select the type of irradiation sensor. The following settings are possible:

ExtSolIrr	External irradiation sensor
IntSolIrr	Internal irradiation sensor (only with Sunny SensorBox)

6. In the "Temperature sensor" field, select the sensor based on the serial number of the Cluster Controller / Sunny SensorBox.
7. Select type of temperature sensor. The following settings are possible:

TmpAmb	Ambient temperature sensor
TmpMdul	Module temperature sensor

8. In the "Tolerance range between" field, enter the upper and lower limits of the tolerance range for the performance ratio (default settings: 0.0 und 1.0). If the performance ratio is outside the tolerance range, a warning will be logged in the plant logbook.
9. Select [Save].

9 Publishing Sunny Portal Pages

There are two options for publishing the Sunny Portal pages of your PV plant:

- Release the pages on www.SunnyPortal.com
- Integrate the plant profile in your own Internet website

Releasing pages on www.SunnyPortal.com

If you release Sunny Portal pages of your plant on www.SunnyPortal.com, interested people will be able to find your plant on www.SunnyPortal.com under "Publicly Available Plants" and view the released pages.

1. Log into Sunny Portal with the user role "Installer" or "Plant administrator".
2. Select the desired page in the page and drop-down menu.
3. Select the "Page configuration" tab.

   or

   In the Contents area, select [Configuration - "Name of the Page"].
4. In the "Approval" area, activate the "Also release page on www.sunnyportal.com" checkbox.
5. To send the page by e-mail, select "Send the website by e-mail", enter the e-mail address of the recipient, select [Send e-mail], and select .
6. Select [Save].

☑ The icon is displayed in the page and drop-down menu next to the name of the released page. To view the released pages of the plant, select the hyperlink "Open released pages of this plant" under "Configuration > System Presentation".

Integrating the plant profile in your own Internet website

1. Log into Sunny Portal with the user role "Installer" or "Plant administrator".
2. Select "Configuration > System Presentation".
3. In the "Plant profile" area, copy the source code of the page to the clipboard and link it into your own website via a so-called inline frame.

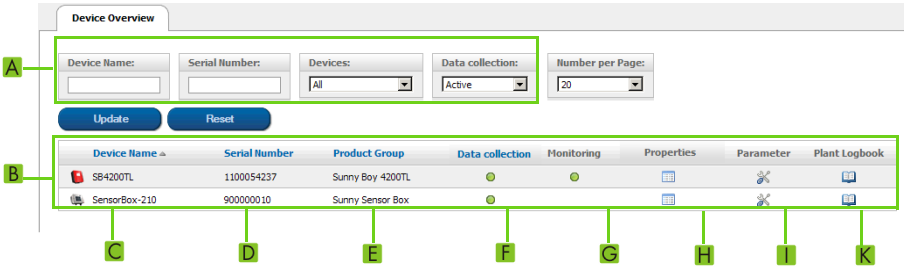
10 Device Settings

10.1 Calling Up and Filtering the Device Overview

On the "Device overview" page, you can view details of all devices in your plant and make device-specific settings. The "Overview of New Devices" tab will only be visible if Sunny Portal has detected new devices in your plant.

1. Select "Configuration > Device Overview".

   ☑ The device overview of all devices in the active plant now opens.



Item	Meaning
A	Settings for filtering the device overview
B	Device Overview
C	Device name: name of the device
D	Serial number: serial number of the device
E	Product group: device group, e.g., Sunny Boy 4200TL
F	*Data collection: indicates whether the data of this device is to be used on your Sunny Portal pages, see Section 10.2.1 "Activating/Deactivating the Device" (page 63).
G	*Monitoring: indicates whether the device (inverter, Sunny WebBox) is participating in plant monitoring, see Section 7.3 "Plant Monitoring" (page 40).
H	Properties: opens tab with device properties of the device, see Section 10.2 "Calling Up Device Properties" (page 59).
I	Parameters: opens the "Parameters" tab of the device, see Section 10.3 "Calling up the Parameters of a Device" (page 68).
K	Logbook: opens the "System logbook" tab with filtered messages for this device, see Section 7.2 "System Logbook" (page 39).

* = active, = deactivated

2. To filter the device overview, set the desired filters. The following settings are possible:

Device name	Enter the complete name of a device or parts of a device name.
Serial number	Enter the complete serial number of the device or parts of the serial number.
Devices	Select the required device class, e.g., PV inverter or sensor.
Data collection	Select the status of the required devices. • all: both activated and deactivated devices are displayed. • active: only activated devices are displayed. • deactivated: only deactivated devices are displayed.

3. Select [Refresh].
4. To delete filter settings, select [Reset]. TIP: You can sort the devices in the table of the device overview in ascending or descending order by clicking on a blue entry in the table header (device, serial number, device active).

10.2 Calling Up Device Properties

1. Select "Configuration > Device Overview".
2. In the device line, select the icon for device characteristics.

☑ The device characteristics window opens.

Explanation of Device Properties:

Designation	Meaning
Data collection	Indicates whether the device is activated in Sunny Portal (see Section 10.2.1 "Activating/Deactivating the Device" (page 63)). Activated devices are used in Sunny Portal, deactivated devices are not used. = Device is activated in Sunny Portal. = Device is deactivated in Sunny Portal.
Product group	Device group, e.g. Sunny Boy 4200TL
Serial number	Serial number of the device
IP address (only with Sunny WebBox and Cluster Controller)	By selecting the IP address, you can access the user interface of the Sunny WebBox or Cluster Controller directly. To do this, you may need to set up port forwarding in your router (see router manual).
MAC address (only with Sunny WebBox)	MAC address of the Sunny WebBox
Manufacturer	Device manufacturer

Designation	Meaning
Device name	Device name The serial number of the device is displayed as the default device name (to change the name, see Section 10.2.2 "Changing the Device Name" (page 64)).
Description	Space for comments on the device (see Section 10.2.3 "Changing the Device Description" (page 64))
Irradiation sensor connected (only with Cluster Controller)	Indicates whether an irradiation sensor is connected to the Cluster Controller. = Irradiation sensor connected = No irradiation sensor connected
Module temperature sensor connected (only with Cluster Controller)	Indicates whether a module temperature sensor is connected to the Cluster Controller. = Module temperature sensor connected = No module temperature sensor connected
Outside temperature sensor connected (only with Cluster Controller)	Indicates whether an outside temperature sensor is connected to the Cluster Controller. = Outside temperature sensor connected = No outside temperature sensor connected
Phase (L1, L2, L3) (only with inverters)	Phases to which the device is connected (see Section 10.2.4 "Setting the Phase" (page 64)). = The device is connected to this phase. = The device is not connected to the phase or the phase is not yet configured.
Generator capacity (only with inverters)	Total power of all PV modules connected to a PV inverter.
Meter reading total yield (only with inverters)	Meter reading of inverter total yield during the current day
Communication monitoring (only with Sunny WebBox, Cluster Controller and Power Reducer Box)	Shows the settings of this Sunny WebBox/this Cluster Controller/this Power Reducer Box for communication monitoring (see Section "Explanation of device properties – Communication monitoring (only for Sunny WebBox, Cluster Controller and Power Reducer Box):" (page 61)).
Inverter comparison (only with inverters)	Shows the settings of the inverter for this inverter comparison (see Section "Explanation of device properties - Inverter comparison (only for inverters):" (page 61)).

Explanation of device properties – Communication monitoring (only for Sunny WebBox, Cluster Controller and Power Reducer Box):

Designation	Meaning
Monitoring	Here you can activate or deactivate communication monitoring for this communication device* .
Alert after	Indicates the period of time with no contact between Sunny Portal and this communication device* which must elapse before you receive an e-mail.
Interval	Shows the frequency with which the communication device* sends data to the Sunny Portal (configuration via user interface of the communication device*).
Time period	Indicates in which period the communication device* sends data to the Sunny Portal (configuration via user interface of the communication device*).

*Sunny WebBox, Cluster Controller or Power Reducer Box.

Explanation of device properties - Inverter comparison (only for inverters):

Designation	Meaning
Monitoring	Here you can activate or deactivate the inverter comparison for this inverter.
Tolerance [%]	Here, you can enter the permissible tolerance for the specific yield of this inverter. If the specific yield is outside the tolerance range, Sunny Portal will inform you by e-mail.

Explanation of device properties – Device status of the Cluster Controller

- To display the device status of the Cluster Controller, select the "Device Characteristics" page of the Cluster Controller and go to the "Device status" tab.

Designation	Meaning
Device status	Indicates the device status of the Cluster Controller (see page 43).
Grid management	Indicates whether grid management is activated in the Cluster Controller (see the Cluster Controller user manual).
Active power limitation*	Parameter for active power limitation
Cos Phi setpoint*	Parameter for the cos Phi setpoint
Target value	Indicates the current target value for active power limitation or the cos Phi setpoint. The target value is specified by the network operator.
Actual set value	Indicates the current actual set value for active power limitation or the Cos phi setpoint. The actual set value is sent to the inverters by the Cluster Controller.
Source of target value	Indicates the type of signal source.
Last contact	Shows the date and time of the last contact between the Cluster Controller and the Sunny Portal.

*The data for active power limitation and cos Phi setpoint are displayed when the respective function is activated.

Explanation of device properties – Device status of Power Reducer Box

- To display the device status of the Power Reducer Box, select the "Device Characteristics" page of the Cluster Controller and go to the "Device status" tab.

Designation	Meaning
Device status	Indicates the device status of the Power Reducer Box (see page 43).
Operating mode	Displays the operating mode for grid management which is configured in the Power Reducer Box, e.g., "Active power limitation" (see user manual of the Power Reducer Box).
Setpoint (target)	Indicates the current target value for grid management. The target value is specified by the network operator.
Setpoint (actual)	Indicates the current actual value for grid management. The actual value is transmitted to the plant by the Power Reducer Box.
Status of the inputs	Indicates the status of the digital inputs from the ripple control receiver. • "Open": no signal • "K1 + K2" (example): relay 1 and relay 2 are closed.
Communication monitoring deactivated/activated	Indicates whether the communication monitoring for the Power Reducer Box is switched on or off.

10.2.1 Activating/Deactivating the Device

1. If you want to remove a device from your plant or if you do not want to have a device displayed on Sunny Portal, you can deactivate the device on Sunny Portal. The data of the deactivated device is then no longer available for calculating diagrams and tables. However, in contrast to the deletion of a device (see Section 10.2.6 ”Deleting a Device” (page 67)), the data of a deactivated device is retained on Sunny Portal Select "Configuration > Device Overview".
2. In the device line, select the icon for device characteristics.
   ☑ The device characteristics window opens.
3. Select [Edit].
4. In order to activate a device, activate the "Data collection" field.
5. In order to deactivate a device, deactivate the "Data collection" field.
6. Select [Save].

10.2.2 Changing the Device Name

The serial number of the device is displayed as the default device name.

1. Select "Configuration > Device Overview".
2. In the device line, select the icon for device characteristics.
   ☑ The device characteristics window opens.
3. Select [Edit].
4. Enter new name in the "Name" field.
5. Select [Save].

10.2.3 Changing the Device Description

1. Select "Configuration > Device Overview".
2. In the device line, select the icon for device characteristics.
   ☑ The device characteristics window opens.
3. Select [Edit].
4. Enter your remarks on the device in the "Description" field.
5. Select [Save].

10.2.4 Setting the Phase

You can set the phase into which the inverter feeds.

1. Select "Configuration > Device Overview".
2. In the device line, select the icon for device characteristics.
   ☑ The device characteristics window opens.
3. Select [Edit].
4. Activate the respective field L1, L2, or L3 in the "Phase" area.
5. Select [Save].

10.2.5 Setting the Generator Capacity

You only need to make the settings in this section if Sunny Portal is to calculate the entire power of your plant or if you are using the "Inverter comparison" function. Sunny Portal calculates the plant power from the aggregate power of the inverters (generator capacity).

Options for setting the generator capacity:

- Enter the power of an inverter manually
- Configure the power of an inverter via multiple strings

Entering the power of an inverter manually

1. Select "Configuration > Device Overview".
2. In the inverter line, select the icon for the device characteristics.
   ☑ The device characteristics window of the inverter opens.
3. Select [Edit].
4. Enter inverter power in the "kWp" field under "Generator power".
5. Select [Save].
6. Activate calculation, see Section 8.1.4 "Setting the Plant Power" (page 50), paragraph "Calculating the plant power from total power of all inverters" (page 51).

Configuring the power of an inverter via multiple strings

1. Select "Configuration > Device Overview".
2. In the inverter line, select the icon for the device characteristics.
   ☑ The device characteristics window opens.
3. Select [Edit].
4. Call up page for string settings:
   - To add a new string, select [Add string].
   - To copy an existing string, select [Copy] in the string line and then edit it.
   - To edit an existing string, select [Edit] in the string line.

   ☑ The menu for configuring the string opens.

5. Configure the string. The following settings are possible:

Designation	Enter name for the string
Manufacturer	Select the module manufacturer
Module type	Select the type of module You must set the manufacturer first. The menu content will vary depending on the selected manufacturer.
Module power	This data is entered automatically when you select the module type. You can enter adjustments in the fields using the arrows or the arrow keys on the keyboard.
Module surface	
Efficiency	
Number of modules	Enter the number of modules on the string
Azimuth angle	You can enter the azimuth angle of the string module surfaces here. The azimuth angle indicates the number of degrees by which the module surfaces deviate from an exact southern orientation. • Tracking If your modules track the sun automatically, activate this field.
Tilt angle	Set the tilt angle of the string module surfaces. The tilt angle indicates the number of degrees by which the module surfaces deviate from the horizontal. • Optimized If your plant is optimized for latitude, activate this field. In Germany, the optimum orientation is 30° from the horizontal.
Description	Enter comments

6. Select [Accept].
   ☑ The device characteristics page opens. The string is configured.
7. Select [Save].
8. Activate calculation, see Section 8.1.4 "Setting the Plant Power" (page 50), paragraph "Calculating the plant power from total power of all inverters" (page 51).

10.2.6 Deleting a Device

If you delete a device, all the data of that device is deleted permanently. Check in advance whether it is sufficient to deactivate the device (see Section 10.2.1 "Activating/Deactivating the Device" (page 63)).

Replacing a device using the configuration wizard

After you have replaced a device using the configuration wizard (see Section 10.2.7 "Adding/Replacing Devices (Configuration Wizard)" (page 67)), the replaced device is automatically deleted.

1. Select "Configuration > Device Overview".
2. In the device line, select the icon for device characteristics.
   ☑ The device characteristics window opens.
3. Select [Edit].
4. Select [Delete].
   ☑ A security prompt opens.
5. To delete the device permanently, select [Delete].

10.2.7 Adding/Replacing Devices (Configuration Wizard)

You can add new devices to Sunny Portal or replace devices as soon as the communication device starts transmitting data from the new devices to Sunny Portal. Sunny Portal recognizes the new devices and opens the configuration wizard automatically when you log into Sunny Portal with your access data. From a total of 10 or more devices, you can add several devices simultaneously by clicking the button underneath the list. After you have replaced a device using the configuration wizard, the replaced device is automatically deleted in Sunny Portal.

1. To open the configuration wizard manually, select either "Name of Your Plant > Plant Monitoring" or "Configuration > Device Overview > Overview of New Devices".
   ☑ The configuration wizard opens.
2. Select [Set up device now].
3. To add a device, select + in the device line and follow the instructions of the configuration wizard.
4. To replace a device, select ⇄ in the device line and follow the instructions of the configuration wizard.
5. To add or replace another device, repeat the above steps.

10.3 Calling up the Parameters of a Device

The parameters are described in the respective device manual. The device parameters are read-only and cannot be changed. If you want to change the parameters, use the Sunny WebBox or the Sunny Explorer software from SMA Solar Technology AG.

1. Select "Configuration > Device Overview".
   ☑ The device overview of all devices in the active plant now opens.
2. In the device line, select the parameter icon.
   ☑ The device parameters open.
3. In order to view the history of a parameter, select the history icon.

11 User Management

11.1 User Concept with Roles and Privileges

You can create additional users in your Sunny Portal, so that they will have access to your Sunny Portal. You can assign roles to users. Roles differ in the privileges the user enjoys in your Sunny Portal, for example, whether the user is authorized to create a new page. The following roles are possible:

- Guest
- Standard user
- Installer
- Plant administrator

Overview of Roles and Privileges

Privileges	Role			
	Guest	Standard	Installer	Administrator
Login	✓	✓	✓	✓
View pages	✓	✓	✓	✓
View and change user information	✓	✓	✓	✓
Change password	–	✓	✓	✓
View plant properties	–	✓	✓	✓
View device properties	–	✓	✓	✓
View report configuration	–	✓	✓	✓
View, change and delete pages	–	–	✓	✓
View and change plant properties	–	–	✓	✓
View and change device properties	–	–	✓	✓
View and change report configuration	–	–	✓	✓
View and change calculated channels	–	–	✓	✓
View system logbook and confirm entries	–	–	✓	✓
Import data	–	–	✓	✓
View user management	–	–	–	✓
Create and delete users and assign roles	–	–	–	✓

11.2 Creating a New User

User is notified by e-mail

If you create a new user, he will receive an e-mail informing him that he has access to your Sunny Portal under this e-mail address. If the new user is not yet registered in Sunny Portal, he will also receive an automatically generated password.

1. Select "Configuration > User Management".
2. Select [New User].
3. In the "E-mail address:" field, enter the e-mail address of the new user.
4. In the "Roles" area, activate the desired role. The "Standard user" role is activated by default.
5. Select [Save].

☑ The new user has been created and will receive an e-mail with the access details.

11.3 Changing User Privileges

1. Select "Configuration > User Management".
2. In the user line, select the edit icon.
3. In the "Roles" area, activate the desired role.
4. Select [Save].

11.4 Changing User Information

Every user created (except for "Guest") receives his own "User Information" page. On this page, each user can enter his own data.

1. Select "User Info/Logout".
2. Select "User Information".
3. Select [Edit].
4. Fill in the fields.
5. Select [Save].

11.5 Deleting a User

Never delete the e-mail address used by the communication product.

Never delete the user whose e-mail address is used by the communication product (e. g. Sunny WebBox, Cluster Controller) to send data to Sunny Portal. Otherwise, the communication product will no longer be able to send data to Sunny Portal. If you want to enter a new e-mail address in the communication product, proceed as follows:

- Create a user with the new e-mail address in Sunny Portal and assign the role of "Administrator" or "Installer" (see Section 11.2 "Creating a New User" (page 70)).
- In the communication product, enter the new e-mail address for sending data to Sunny Portal.
- In Sunny Portal, delete the user with the old e-mail address as described below.

1. Select "Configuration > User Management".
   ☑ The "User Management" page opens.
2. In the line of the user, select the delete icon.
   ☑ A security prompt opens.
3. Click [Yes] to delete the user.

11.6 Changing your Password

Each user created (except "Guest") can change his password for Sunny Portal access.

1. Select "User Info/Logout".
2. Select "User Information".
3. Select "If you want to change your password, please click here" under the table.
   ☑ The "Change password" tab opens.
4. Enter the previous password in the "Old password" field.
5. Enter new password in the "New password" field.
6. Enter new password again in the "New password (re-enter)" field.
7. Select [Save].

12 Troubleshooting

Problem	Cause	Remedy
The pop-up window does not open.	Pop-up windows are blocked by the web browser or additional programs (e.g. Google Toolbar).	Enable pop-ups in the web browser and any additional programs.

13 Glossary

Azimuth angle

The azimuth angle indicates by how many degrees the module surface deviates from the compass point due south. In the southern hemisphere, it indicates the deviation from due north. If the module surfaces are facing due south, the azimuth angle is 0°.

Generator capacity

The generator capacity is the maximum power of the PV modules that are connected to one inverter.

kWp

See peak power

Nominal power (kWp)

See peak power

Peak power (kWp)

The peak power is the maximum power output calculated for a PV module under STC (Standard Test Conditions).

The peak power is measured in watt peak (Wp), kilowatt-peak (kWp), or megawatt-peak (MWp). Peak power is also called nominal power.

STC: standard test conditions in the laboratory under which the electrical characteristics of a PV module are measured. This enables the comparison of different PV modules. The PV modules are subjected to vertical irradiation of 1,000 W/m^2, an ambient temperature of 25°C, and a wind speed of 1 m/s. The electrical characteristics are then measured. The test conditions are designed to correspond to the ideal ambient conditions for operation of an installed PV module.

Plant power in kWp

The plant power in kWp (kilowatt peak) is the maximum possible plant power. The plant power in kWp is also known as the nominal power of the plant.

The peak power of a PV plant is the sum of the peak powers of all PV modules installed (see peak power of a PV module). The peak power of a PV plant is used to compare the plant yield and plant costs with other PV plants, for example. The peak power of a PV plant is often referred to as "plant power (kWp)".

An installed plant can rarely achieve peak power because it is not installed in laboratory conditions.

Predicted annual yield (kWh)

The predicted annual yield of a plant is calculated using the specific annual yield (kWh/kWp) at the plant location and the plant power in kWp (also known as nominal power).

You can obtain the specific annual yield for your PV plant location from irradiation maps.

Specific annual yield (kWh/kWp) x nominal power (kWp) = predicted annual yield (kWh)

Example: Calculation of the predicted annual yield

The specific annual yield at a PV plant location is approximately 900 kWh/kWp. The nominal power of the PV plant is 4.8 kWp.

Predicted annual yield = 900 kWh/kWp x 4.8 kWp = 4,320 kWh

PV module

Electrical circuitry of several PV cells that are encapsulated in an enclosure to protect the sensitive cells against mechanical stresses and environmental influences.

Specific annual yield (kWh/kWp)

The specific annual yield is a calculated average value of specific plant yield values of different PV plants for a location. You can obtain the specific annual yield for your PV plant location from irradiation maps. You can assess the efficiency of your PV plant by comparing the specific plant yield of your PV plant with the specific annual yield for your PV plant location.

Specific plant yield (kWh/kWp)

The specific plant yield is a key figure that describes the efficiency of a PV plant, regardless of its size. The specific plant yield is dependent on the irradiation at the location, the ambient temperature, shading, tilt and azimuth angle of the PV modules, and the module and inverter power.

You can assess the efficiency of your PV plant by comparing the specific plant yield of your PV plant with the specific annual yield for your PV plant location.

The specific plant yield is calculated from the actual measured energy yield (kWh) of a PV plant for a specific period (e.g. a year or a month) divided by the peak power (kWp) of the PV plant.

Example calculation of the specific plant yield for one year

Your PV plant consists of 40 PV modules, each with a peak power of 120 Wp (watt peak) as per manufacturer specification. Hence, your PV plant has a peak power of 40 x 120 Wp = 4,800 Wp = 4.8 kWp.

To calculate the specific plant yield of your PV plant for the year 2011, for example, you will need the actual (measured) energy yield of your PV plant for 2011, e.g. 3,200 kWh. You can now calculate the specific plant yield of your PV plant for the year 2011: 3,200 kWh divided by 4.8 kWp = 666 kWh/kWp in 2011.

Tilt angle

The tilt angle indicates by how many degrees the module surface deviates from the horizontal.

14 Contact

If you have technical problems concerning our products, please contact the SMA Service Line. We require the following information in order to provide you with the necessary assistance:

- Plant name, plant identifier, or e-mail address (see Section 8.1).
- Type and serial number of communication product (see manual of the communication product)
- Type of data transmission (network, analog, ISDN, GSM)
- If there is a dial-up option to the communication device: phone number

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